

Maternal Mortality in Resource-Poor Settings: Policy Barriers to Care

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Maternal mortality remains one of the most daunting public health problems in resource-poor settings, and reductions in maternal mortality have been identified as a prominent component of the United Nations Millennium Development Goals. The World Health Organization estimates that 515 000 women die each year from pregnancy-related causes, and almost all of these deaths occur in developing countries.

Evidence has shown that access to and utilization of high-quality emergency obstetric care (EmOC) is central to efforts aimed at reducing maternal mortality. We analyzed health care policies that restrict access to life-saving EmOC in most resource-poor settings, focusing on examples from rural India, a country of more than 1 billion people that contributes approximately 20% to 24% of the world's maternal deaths. (*Am J Public Health*. 2005; 95:200–203. doi: 10.2105/AJPH.2003.036715)

THROUGHOUT HISTORY,

pregnancy has carried a high risk of death secondary to such complications as obstructed labor, ruptured uterus, postpartum hemorrhage, postpartum infection, hypertensive disease of pregnancy, and complications stemming from unsafe abortion. Significant reductions in maternal mortality began only in the late 19th century in Europe and North America. As late as 1934, there were 441 maternal deaths per 100 000 births in England and Wales.¹ By 1950, however, there were 87 deaths, and by 1960 there were only 39.¹ Critical to these reductions was dramatic improvement in maternity care, including improvements in sepsis control, the availability of blood transfusions, the introduction of antibiotics, access to safe cesarean sections and abortion services, and, where abortion is illegal and therefore unsafe, access to effective postabortion care.

Although maternal mortality has declined dramatically in the developed world, the risk of such death remains a serious threat for women in much of Asia, Latin America, and Africa, particularly in rural settings. The World Health Organization (WHO) estimates that 515 000 women die each year from pregnancy-related causes, and almost all of these deaths occur in developing countries. The maternal mortality ratio for Africa is approximately 1000 per 100 000 live births, compared to 8 to 12 per 100 000 live births in North America.² In the mid-1980s, ma-

ternal mortality was identified as one of the developing world's most neglected tragedies.³

This situation is particularly tragic because no new technologies or drugs are needed to radically lessen maternal mortality. Rather, we believe that widespread access to emergency obstetric care (EmOC), and more generally to community-based and hospital maternity care services, would lead to dramatic reductions in these unacceptably high ratios. Significant declines in maternal mortality in Sri Lanka and Malaysia over the past 50 to 60 years provide evidence that the implementation of maternal health interventions in developing countries is feasible. Increased access to skilled birth attendance accompanied by the development of EmOC and other complementary health services were key contributors to the reductions achieved in those countries.⁴

Antenatal screening alone has been shown to be an ineffective tool in mortality reduction, as it is not feasible to predict or prevent most complications of pregnancy and childbirth. Instead, one must assume that all pregnant women are at risk for complications, and women who develop life-threatening complications such as obstructed labor, infection, or serious hemorrhage must receive treatment within a reasonable period of time.⁵

Appropriately trained personnel and the provision of necessary supplies and equipment are critical to the development and

implementation of effective EmOC services. With regard to the issue of trained personnel, too little attention has been paid to assessing how medical care policies regarding provider roles can affect the availability of EmOC and other essential services.^{6,7} In this paper we examine how policies related to the practice of obstetrics and the administration of anesthesia affect access to life-saving EmOC services in rural areas, using medical policies in India as a case study.

A CASE STUDY: INDIA

With more than 1 billion people, a per capita gross national income of only US\$460, and 86% of the population with an income below US\$2 per day, the public health challenges in India are great.⁸ Two national health surveys carried out in 1992–1993 and 1998–1999 reported maternal mortality ratios of 437 and 540 per 100 000 live births, respectively.^{9,10} Given the complexity of measuring maternal mortality ratios, it is likely that both are significant underestimates. International health organizations estimate that about 100 000 to 120 000 women die every year in India, a nation that accounts for 20% to 24% of all maternal deaths in the world.²

Since the late 1950s the Indian government has been developing health services in rural areas. Currently there are 593 administrative districts in India, each with a population of about

1 to 2 million, and each with a hierarchy of medical care facilities. Each district has a government district hospital (DH) with 100 to 300 beds. Below the DH is the community health center (CHC), which has 30 to 50 beds and serves a population of 100 000. Below the CHC is the primary health care (PHC) center staffed by a medical officer, which covers a population of 30 000. Below the PHC are sub-health centers staffed by auxiliary nurse midwives, which serve a population of 5000.

The focus of the PHC system later changed from basic maternal and child health care to family planning and the training of traditional birth attendants. Over the years, priorities have shifted, but intrapartum care has remained greatly neglected, despite a 1983 health policy statement specifying that adequately trained persons conduct all deliveries so that complicated cases receive timely and expert attention.¹¹ Neither the government nor the donor community have recognized the importance of EmOC provision in reducing maternal mortality ratios, although some limited efforts were made to establish first-referral units (FRUs) by redesignating 1 out of 4 CHCs.¹²

As in many developing countries, there are no explicit, detailed written policies, rules, or regulations in India specifying who is allowed to do what level of medical procedures, including obstetrical and anesthesia procedures. The absence of any type of formal policy creates a situation where actions are guided by social situations, the market, and other forces. In this article, we consider the wide spectrum of policy situations that affect EmOC.

TABLE 1—Percentage of Health Facilities in India with Specialists, General-Duty Doctors, and Operation Theaters¹³

	District Hospitals, % (n = 210)	First-Referral Units, % (n = 760)	Community Health Centers, % (n = 886)
Obstetrician/gynecologist	78	48	29
Anesthesiologist	70	22	10
General-duty doctor	94	89	81
Operation theater	98	93	86

OBSTETRICS ONLY BY OBSTETRICIANS

In a resource-poor country such as India, where 70% of the people live in more than 550 000 villages, it is impossible for every health facility to have an obstetrician. In many districts there are only 1 or 2 government obstetricians serving an average of 2 million people. On the other hand, each district has about 50 to 70 general-duty medical officers in various government hospitals and health centers. A national facility survey done in 1999 showed that most of the DHs, FRUs, and CHCs had general-duty doctors (or “medical officers”) and operation theaters, but many health institutions lacked obstetrician/gynecologists and anesthesiologists—especially in FRUs and CHCs (Table 1).¹⁴ Current government policy encourages only qualified postgraduate obstetricians to perform cesarean sections. The job description of medical officers, who have a basic medical degree (bachelor of medicine, bachelor of surgery, or MBBS) after 5.5 years of medical education, does not include performing cesarean sections or any other emergency surgery.^{15–17}

In contrast, some countries allow personnel other than obstetricians to carry out emergency procedures. In Mozambique, the scarcity of trained obstetricians

and other professionals with sufficient surgical training led the Ministry of Health to initiate a 3-year training course for nondotor assistant medical officers to become surgical technicians. An evaluation comparing the outcomes of 2071 cesarean deliveries performed by assistant medical officers and specialists in obstetrics and gynecology, focusing on postoperative complications, demonstrated no clinically significant differences in outcomes between the 2 groups.¹⁸ A study from the Democratic Republic of the Congo reports on the experience of a missionary hospital program in which locally recruited and trained midwifery personnel received carefully supervised training to perform cesarean sections. Some 300 procedures were carried out during the study period with very low complication and death rates, comparable to the rates seen with procedures performed in the same setting by physicians.¹⁹

Nepal has instituted policies to allow midwives and nurses to perform more EmOC procedures. For the last 3 years, the government—with help from the British Department for International Development, the United Nations Children’s Fund (UNICEF), and the Averting Maternal Death and Disability (AMDD) Program based at Columbia University, New York,

NY—has been training midwives to manage most complications of pregnancy and childbirth.²⁰ The American College of Nurse-Midwives has been training midwives from many developing countries in life-saving skills for EmOC, including management of hemorrhage, sepsis, hypertensive disease of pregnancy, and prolonged labor.²¹

In theory, medical officers and other medical personnel can perform all EmOC procedures as defined by the WHO, such as manual removal of a retained placenta, suturing of vaginal tears, assisted vaginal delivery, and management of an incomplete or septic abortion. However, India lacks specific policies to promote the provision of basic EmOC by medical officers; these professionals do not receive specific training to carry out such procedures, nor are they expected to perform them. Auxiliary nurse-midwives, the lowest level of government health workers, and their supervisors, the lady health visitors, are not permitted to perform any emergency obstetric procedures;^{22,23} cases are referred to higher levels of care.

However, most women either do not follow through with care at higher levels or arrive at facilities much too late to receive the life-saving care needed.^{24–26} Women who need cesarean sections or other emergency obstetric procedures in rural and remote areas often must travel for hours to the DH, where an obstetrician may be available. The lack of medicines and supplies, as well as recent cost-recovery policies at government hospitals, has further increased expenditures for referred patients. Due to these barriers, many women hesitate to seek care and die at home or in transit. Studies done

in the Indian states of Andhra Pradesh, Maharashtra, and Rajasthan found that 42% to 52% of maternal deaths occurred at home or in transit to a hospital. The availability of qualified personnel at health facilities closer to home can help reduce the delays in seeking and receiving needed care as well as encourage more families to take women with complications to hospitals or health centers.

ANESTHESIA ONLY BY ANESTHETISTS

Worldwide, there are very few anesthetists available in rural settings. In India, most rural districts have only 1 to 3 anesthetists (Table 1). Anesthesia training is given only to doctors. Relatively few positions are available for postgraduate training in anesthesia,¹⁴ and the majority of the few anesthetists there are prefer to work in urban areas, mainly in private practice, or go abroad where the earnings are higher and living/working conditions are better.²⁷ The MBBS degree curriculum prescribed by the Medical Council of India for medical officers includes the requirement that, during their internship, each doctor acquire skills in administering spinal and local anesthesia, and be able to provide general anesthesia under supervision.²⁸ However, government policy is unclear on whether medical officers are allowed to give anesthesia or not. The job description for medical officers does not include giving anesthesia, which discourages them from doing so, even in rural and remote areas where there is no qualified anesthetist.^{15,17}

Nurses in India cannot become anesthetists, even though in the United States and in some

countries in Europe and Africa nurses are trained to provide anesthesia and do so safely and effectively. It is estimated that certified registered nurse anesthetists administer 65% of anesthetics in the United States.²⁹ An analysis of the effect of restrictive policies concerning anesthetists, using a hypothetical cohort of 10 000 women needing cesarean section, showed that even if one assumes it is somewhat less safe to receive anesthesia from a nurse compared to a fully qualified anesthesia specialist (and there are no data to suggest this is the case), policies that prevent nurses from giving anesthesia cost more lives than they save.³⁰

In response to the rural shortages, Indian practitioners and hospitals are trying innovative alternatives. Obstetricians and surgeons initially give anesthesia and then operate while a medical officer or a nurse maintains the anesthesia. Some obstetricians in rural areas have been doing cesarean sections under local anesthesia due to the lack of an anesthetist (NS Iyer, DV Mavalankar, unpublished data, 2003).

The WHO and the World Federation of Societies of Anaesthesiologists have stated that medical officers trained for 1 or 2 years in anesthesia can safely administer anesthesia.³¹ Only recently, the Indian government has developed a short anesthesia training course for medical officers on a pilot basis. Bangladesh has been training basic doctors in anesthesia and EmOC, including cesarean section, for some years to provide these services in rural areas.³²

New policy circumstances further challenge the provision of EmOC services. The Indian government enacted the Consumer Protection Act in 1986, institut-

ing a semijudicial process to provide quick justice to consumer complaints. The inclusion of doctors under the purview of this act through decision of the supreme court of India in November 1995 has made it easier to sue a doctor in the event of an adverse outcome. Doctors have turned to practicing defensive medicine, and more patients are referred to higher levels of care to avoid risk of lawsuits.³³ General-duty doctors who were previously giving anesthesia are now declining to do so, fearing litigation and cognizant of the lack of clear government policy.³⁴

WHY DO SUCH POLICIES EXIST IN RESOURCE-POOR SETTINGS?

As is the case in most countries, there is a strong bias among Indian physicians to practice in urban areas and a desire to protect their earnings. Physicians exercise significant political influence through their associations, and they lobby to protect their private practices—for example, through efforts to restrict the provision of care to fully qualified members of the profession and specialty.³⁵ Over the past 2 to 3 decades, there have been major advances in fostering the well-being of children through village-based interventions such as oral rehydration and immunization programs. In contrast, there has been a pervasive view that maternal mortality initiatives require tertiary hospitals, which are thought to be too costly. In fact, much more can be done at the secondary health care level in small rural hospitals and health center settings, particularly if the roles of various levels of practitioners are expanded as described above.

We recognize that measuring changes in maternal mortality rates or ratios over time is not practical, given that maternal mortality is a relatively rare event and vital registration systems are inadequate in most developing countries. To better monitor and evaluate progress in EmOC, 6 process indicators were developed by the AMDD Program in collaboration with UNICEF and the United Nations Population Fund to measure the availability, use, and (to a small extent) quality of such services.³⁶ Policy interventions aimed at improving access to EmOC can incorporate the use of process indicators to both highlight problem areas and monitor the effects of policy change in terms of utilization and quality of services.

SUMMARY

We have presented a case study of India, but such policy barriers are seen in many resource-poor countries. Removing these barriers does not require many resources, but rather an administrative will and understanding of how to improve access to care in rural areas. Rethinking is needed as to what level of health care worker can be trained to provide anesthesia and various EmOC interventions. We have provided examples of innovative approaches in Mozambique and the Democratic Republic of the Congo in which safe and effective services have been provided in settings with few, if any, physicians by other trained health personnel. Although this may seem a double standard in care between developed and developing nations, or between urban and rural areas, it is essential to establish effective health policies that fit local resource sit-

uations and that ensure wide-spread access to critical health services. Governments can institute simple but safe standards of care that can be provided by well-trained physicians, nurses, and other personnel.

Although we have focused on the issue of expanding professional roles, policy interventions must also address the provision of necessary supplies and equipment, such as blood supplies and emergency medicines, to all health care facilities in which trained personnel are posted. National governments, donors, and nongovernmental organizations must commit to addressing policy barriers to reducing maternal mortality, including efforts to increase resources for health care systems in resource-poor settings. ■

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D.V. Mavalankar originated the article and led the conceptual analysis and writing. A. Rosenfield helped form the main ideas and assisted with the writing, review, and editing of the article.

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